



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

EIGHTH GRADE.

KATHARINE M. STILWELL.

OUTLINE FOR FEBRUARY AND MARCH.

History.—1. Our study of the history of the Cumberland road and the Erie canal has suggested the question of "internal improvements;" also the relation of the United States government to the state governments. We shall study here more fully than we have done before the organization of the United States government.

2. The seat of the national government; survey of the Potomac site; plan of the city of Washington—a study of civic beauty. Washington the statesman: a study of his life in connection with the Washington birthday exercises.

3. Invention of the cotton gin; the cotton industry; the unification of the South.

4. Trade conditions in the South and the West; the Mississippi, a thoroughfare; New Orleans, a market. The Louisiana Purchase; cost; extent of this territory; its physical features; its settlement; questions of government.

5. The problem before the national government—the political unification of the North and the South. (*a*) Political separation due to inherited differences (religion); climatic differences, resulting in social and industrial differences. (*b*) Material interests of both sections increased by improved means of communication (roads, canals, railroads, post-offices); development of internal commerce; inventions (telegraph, etc.). (*c*) Divergent interests indicated by political struggles: control of representation in the national government (admission of states); Oregon expansion; acquisition of Texas; slavery legislation; the Civil War. (*d*) Relation of industrial conditions to political unity: the transcontinental railway; ocean cables; material prosperity; the South as a new field for investments.

6. Problems before the nation today: colonial expansion, Russian America, Hawaii, Cuba, Porto Rico, Philippines; relation of citizens to national problems.

Geography.—A detailed study of North America, with special reference to those parts which form the scene of action for the history. Current events and the geography of the countries in which these events occur, continued. A special study of the geography of our colonies. The pupils have already sent letters to school children in Honolulu, San Juan, and Manila inquiring about the Sandwich Islands, Porto Rico, and the Philippines, and an exchange of products will be made.

Nature study.—Each pupil will keep a daily weather record, which will give rise to a consideration of the following topics: the average temperature; the maximum temperature; the minimum temperature; the relation of

length of day to the average temperature; the amount of precipitation; the per cent. of actual sunshine compared with the possible sunshine. (Compare present month with the preceding months of the school year in each of the above items.) Area covered by given sunbeam, measurements taken once a week; relation of length of day to slant of sun's rays; relation of barometric pressure to clouds, to precipitation, to winds, to temperature, to humidity; weather maps.

There will be a daily painting by each pupil of the landscape for the weather records. Weather conditions will be represented in some graphic form to be devised by the class:

We shall continue the subject of heat: the influence of heat upon solids, liquids, and gases (expansive power); its influence upon the atmosphere (air pressure and movement).

The birds (winter residents and returning birds) will be observed. A bird calendar will be made.

The class will measure the temperature and moisture of the soil, and note the relation to seeds and plants. They will observe the winter condition of buds and watch the first signs of plant growth.

Home economics.—Every Thursday afternoon has been set apart for work in this department. In each lesson the cooking of the foods is preceded by a general discussion of the food materials, with experiments to determine their nature.

The subjects for discussion will include the composition of the body, the food principles, the function of food in general, and the function of each of the food principles.

The cooking will be based on the food principles, beginning with the proteids in milk and eggs.

Physical training.—(See seventh grade.)

Mathematics.—The problems in the nature study involve averaging, percentage, the use of scales and weights, areas of rectangles and circles, measuring of bulk and volume, and the measurements of angles.

In addition to these, the home economics will require the buying and measuring of food materials and the keeping of the account-books for the daily luncheon.

APPLIED ALGEBRA—GRADUATION OF THERMOMETERS.

In connection with the meteorology the following work in applied algebra will be given:

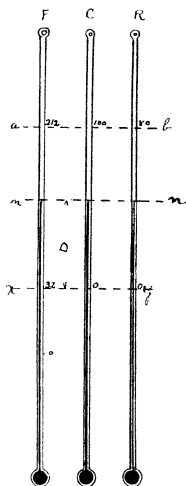
Take three thermometer tubes, exactly alike, filled with mercury to the same point. Immerse their bulbs in a vessel containing melting ice. Mark points on the tubes at the tops of the mercury columns, on the first 32, and on the second and third 0. Now immerse all three of the bulbs in boiling water, and mark the tops of the mercury columns—on the first 212, on the second 100, and on the third 80. Let xy of the accompanying figure denote

the straight line passing through the tops of the three mercury columns when the bulbs are in melting ice. Let ab denote a line passing through the tops of these columns when the bulbs are in boiling water.

Suppose the space lying between the line xy and the line ab on the first to be divided into 180 equal spaces, and call each of these smaller spaces *one degree Fahrenheit* (1°F.). Denote its length by f .

Suppose this same space on the second tube between the lines xy and ab to be divided into 100 equal spaces, and call one of these smaller spaces *one degree Centigrade* (1°C.). Denote its length by c .

Divide the space on the third tube between the lines xy and ab into 80 equal spaces, and call one of these spaces *one degree Reaumur* (1°R.). Denote the length of this space by r .



PROBLEMS.

1. Compare the length of the space from 32 to 212 on the first tube with the length of the space from 0 to 100 on the second tube; with the space from 0 to 80 on the third tube. Call this space D .

2. How many f 's equal D ?

3. How many c 's equal D ?

4. How many r 's equal D ?

Since $180f$ equals D , and $100c$ equals D , how must $180f$ compare with $100c$? Answer this by writing an equation. Since $180f = D$, and $80r$ also equals D , how must $180f$ compare with $80r$? If $180f = 100c$, f equals how many times c ? If $180f = 80r$, f equals how many times r ? We have then these equations: $f = \frac{5}{9}c$, and $f = \frac{4}{5}r$.

EQUIVALENT READINGS ON THE THREE THERMOMETERS.

If on the first tube spaces are scratched above the line ab equal to the space on this tube between 32 and 212, and in the same way spaces of the same length are marked below 32, the thermometer is said to be *graduated* to the Fahrenheit scale. If the spaces on the second tube are continued above 100 and below zero, of the same length as the distance between the marks of this tube between the zero and 100, the thermometer is *graduated* to the Centigrade scale. On the third tube, if the spaces between zero and 80 are continued above the line ab and below the line xy , the thermometer is *graduated* to the Reaumur scale.

Numbers are now written beside these scratches thus: On the Fahrenheit tube, above 32, they run 33, 34, 35, etc.; below 32 they run 31, 30, 29, etc. On the Centigrade and Reaumur scales, above 0, the numbers run 1, 2, 3, etc.; and below 0 they run -1 , -2 , -3 , etc.

On all thermometers, when the tops of the mercury columns are above zero, the readings are marked $+$; when below zero, they are marked $-$.

The first of these scales is a common one in the United States and England; the second, in France and in scientific laboratories in the United States, England, Germany, and elsewhere. The third is used in daily life and in science in Germany. The reading of any one of these thermometers is the figure, or figures, standing beside the scratch at the top of the mercury column, and it denotes the number of spaces above the zero point on the thermometer. If the thermometers are exposed to the same temperature between that of melting ice and boiling water, the tops of the mercury columns will stand in some straight line, as *mn*. Suppose the mark on the top of the first tube which stands by this line is called *F*; on the second top, *C*; on the third top, *R*.

1. How many spaces on the first tube equals the distance from the line *xy* to the line *mn*? On the second tube? On the third tube?

2. What is the length of one of these spaces on the first tube? On the second tube? On the third tube?

3. If *f* denotes the length of the space on the first tube, and there are $F - 32$ of these spaces between 32 and the line *mn*, how long is the distance from 32 to the line *mn*?

4. If the length of one space on the second tube is called *c*, and if there are *C* of them between zero and the line *mn*, how long is the space on the second tube between zero and the line *mn*?

5. How long must this space between zero and the line *mn* be on the third tube, if one of the spaces is called *r*, and there are *R* of them between zero and the line *mn*?

6. Letting *D* denote here what it denoted above, what is the value of *D* in terms of *F* and *f*? What is its value in terms of *C* and *c*? Of *R* and *r*?

7. What, then, must be the relation between $(F - 32)f$ and Cc ? Answer with an equation.

8. What must be the relation between *Rr* and $(F - 32)f$?

9. If $\frac{5}{9}c$ equals *f*, $\frac{1}{9}$ of *c* equals what part of *f*? $\frac{5}{9}$ of *c*, or *c*, equals how many times *f*? To what is *r* equal in terms of *f*? Answer by equations.

Answer: (1) $Cc = f(F - 32)$. (2) $Rr = f(F - 32)$.

10. Instead of multiplying *C* by *c*, multiply *C* by its equal $\frac{5}{9}f$. What does equation (1) become?

11. Instead of multiplying *R* by *r* in (2), multiply *R* by the equal of *r*, which is $\frac{5}{9}f$.

We have now two equations: $\frac{5}{9}fC = f(F - 32)$, and $\frac{5}{9}fR = f(F - 32)$.

Divide both sides of both equations by *f*, and you have $\frac{5}{9}C = (F - 32)$, and $\frac{5}{9}R = (F - 32)$.

NOTE.—Instead of using the small letters *f*, *c*, and *r* to denote the length of the spaces, the sign (°) is used. On all instruments the space is called the *degree*, and since its length is not the same for all, the letter *F*, *C*, or *R* is used to distinguish which degree is meant.

Multiply both sides of the first of these equations by $\frac{9}{5}$, and both sides of

the second of these equations by $\frac{4}{9}$, and we obtain $C = \frac{5}{9}(F - 32)$ and $R = \frac{4}{9}(F - 32)$.

These two equations enable us to find the Centigrade and the Reaumur readings which are the equivalent of any given Fahrenheit reading. Can you put the first equation into words?

Verbal statement: The Centigrade reading is found from the Fahrenheit reading by subtracting from the Fahrenheit reading 32° , and multiplying the difference by $\frac{5}{9}$.

State in words the meaning of the equation for R .

To obtain the equation for expressing the Centigrade reading in its Fahrenheit equivalent, multiply both sides of the first of the above equations by $\frac{9}{5}$, and add 32 to both sides of the equation. These steps give us $F - 32 = \frac{9}{5}C$. Add 32 to both sides, and we have $F = \frac{9}{5}C + 32$. The meaning of this equation may be stated in words thus: To obtain a Fahrenheit equivalent of a known Centigrade reading, multiply the Centigrade reading by $\frac{9}{5}$ and add 32.

Derive the equation and state in words a rule for finding a Fahrenheit equivalent of a known Reaumur reading.

It is sometimes important to express a Centigrade reading in its Reaumur equivalent, and the reverse. This may be readily done by starting with the two equations given above. By the axiom: Equals divided by equals give

equal quotients, we find: $\frac{C}{R} = \frac{\frac{5}{9}(F - 32)}{\frac{4}{9}(F - 32)}$.

Canceling the factors common to both numerator and denominator of the right side of this equation, we have $\frac{C}{R} = \frac{5}{4}$, or $C = \frac{5}{4}R$. This tells us that we may find the Centigrade equivalent of a known Reaumur reading by multiplying the Reaumur reading by $\frac{5}{4}$. Taking the equation $C = \frac{5}{4}R$, and multiplying it by $\frac{4}{5}$, we find the equation $R = \frac{4}{5}C$.

Can you tell from this equation how we may find the Reaumur equivalent of a known Centigrade reading?

PROBLEMS.

1. Convert these melting temperatures from C into F and R equivalents:

Mercury	-	-	$-39.2^\circ C$	Zinc	-	-	$+412.0^\circ C$
Ice	-	-	0.0	Silver	-	-	$+1000.0$
Benzol	-	-	$+4.4$	Copper	-	-	$+1100.0$
Tallow	-	-	$+43.0$	Gold	-	-	$+1200.0$
Paraffin	-	-	$+46.0$	Cast iron	-	-	$+1200.0$
Wax	-	-	$+62.0$	Cast steel	-	-	$+1375.0$
Tin	-	-	$+230.0$	Wrought iron	-	-	$+1600.0$
Lead	-	-	$+326.00$				

2. Convert these *C* boiling temperatures into their *F* and *R* equivalents:

Ether - - -	+35° C	Alcohol - - -	+78° C
Carbon disulphide	+46°	Water - - -	+100°
Sulphuric acid -	-10°	Mercury - - -	+357°
Chloroform - -	+61°	Zinc - - -	+1040°

3. Convert any observed *Fahrenheit* readings to their *Centigrade* and *Reaumur* equivalents and readings.

MATHEMATICS RELATED TO HISTORY.

The following paper, written by a pupil, shows the relation of the work in mathematics to history. It also describes the method of surveying used by the class.

During the settlement of the Northwest Territory, it was found necessary to survey the land to be sold for the benefit of the public treasury. Congress appointed Mr. Hutchins to do this work.

The first thing Mr. Hutchins did was to run a north-and-south line (beginning at the southwest corner of Pennsylvania). At the point of crossing the Ohio river, he ran an east-and-west line. He then ran lines parallel to these every six miles, and divided the squares thus made into square miles. The six-mile squares were called "townships" and the one-mile squares were called "sections." Section 16 in each township was reserved for the benefit of public schools.

We decided to measure a township on a scale of 18' = 1 mile.

The first thing we did was to run a line north and south, a few feet from the sidewalk. We found the north-and-south line by setting up a flag-pole and holding it vertically by the aid of a plumb-line. A stake was set at the end of the shadow of the vertical pole at one-half hour before and at one-half hour after apparent noon. These times may be found from an *Ayers Almanac*.

The angle at the foot of the pole between the two stakes was bisected, and two stakes driven in the bisector to fix its position on the ground.

This meridian line was then continued 108 feet toward the south. It was kept straight (ranged in) by setting a third pole in line, with two poles set up at the stakes on the bisector.

When we wanted to turn a right angle we made a triangle having sides of six, eight, and ten feet, then we set the eight-foot side on the line we had already surveyed, and measured along the six-foot side, and continued the line as the original meridian line was ranged in.

When we had measured four sides, we should have been at the starting-point, but, owing to accumulating errors, we were three feet to one side. We therefore measured again, beginning at the same place and going in the opposite direction. This time we measured the right angles by measuring back a few feet from the end on the 108-foot line we had surveyed, and

extending this 108-foot line the same number of feet. We then placed one of the two ends of a string, which was about twice as long as the distance between the two points, on each of these points. The middle of this string, drawn taut, we then placed on the ground in the direction of the side to be measured. The new side must pass through the middle of the string.

German (E. Prokosch).—The pupils have composed, with the help of the teacher, "The Founding of Germantown," a dramatic representation of the first German immigration into America, which will be performed in February.

THE FOUNDING OF GERMANTOWN.

Dramatis personae.—William Penn; Franz Daniel Pastorius, leader of the German immigrants; Jacob, one of the Quakers; Quakers; Germans.

SCENE I.

(Shore of the Delaware river near Philadelphia. The ship "Concord" is seen in the background. Pastorius, with the Germans, steps ashore, where Penn and some Quakers are awaiting them. Time, 1683.)

Penn. Willkommen, Ihr deutschen Brüder! Ich hoffe, Ihr werdet in diesem Lande Glück und Frieden finden.

Pastorius. Ich danke dir, Bruder. Ich bin Pastorius, der Prediger dieser Gemeinde. Und du, der du so freundlich zu uns sprichst, du musst Wilhelm Penn, unser Freund und Wohlthäter, sein.

Penn. Ja, ich bin Penn. [Turns to Jacob.] Brother Jacob, I do not speak German very well; wouldst thou be kind enough to interpret for me?

Jacob. Yea, brother William.

Penn. Tell them that I am very glad they accepted my invitation, and that I promise them again full religious freedom.

Jacob [to Pastorius]. Unser Bruder Penn und wir alle freuen uns, dass Ihr seine Einladung, nach Pennsylvanien zu kommen, angenommen habt. Hier werdet ihr Frieden und Freiheit finden und leben können, wie euer Glaube es verlangt.

Penn. The long and weary journey must have made them tired. So tell them that they will rest as our guests for a few days; then we shall show them the place where we advise them to build a German town.

Jacob. Penn bittet Euch, Brüder, Euch einige Tage als unsere Gäste bei uns auszuruhen. Dann wollen wir Euch einen geeigneten Platz für eine deutsche Niederlassung zeigen.

Pastorius. Nehmt unseren Dank, Brüder! Wahrlich, wir bedürfen der Ruhe, denn die Reise war mühevoll.

Jacob. So kommt! (*Exeunt*. Curtain.)

SCENE II.

(Women setting the table in front of the first two-story house in the German settlement. Enter Penn, Pastorius, Germans, Quakers. Time, several years after 1683.)

Erste Frau. Das ist das erste Sauerkraut, dass ich in Amerika gemacht habe. Aber Ihr werdet sehen, es is echtes deutsches Sauerkraut.

Zweite Frau. Und dieser Schinken schmeckt geradeso wie zu Hause in Westphalen.

Dritte Frau. Da bringe ich die ersten neuen Kartoffeln von diesem Jahre. Heuer sind sie besonders gut.

Vierte Frau [rushing out of the house]. Du lieber Gott, jetzt gib't keine Suppe! Die schöne Nudelsuppe is ganz angebrannt!!

Frauen. Ach Gott! Ach Gott! Was sollen wir ohne Suppe thun?

Erste Frau. Und wir haben keine Zeit, neue Suppe zu kochen. Da kommen ja schon Pastorius und Penn.

Zweite Frau. Setzt Euch, Ihr Herren, und lasst es Euch schmecken!

Pastorius. Zuerst wollen wir das Lied singen, "Eine feste Burg ist unser Gott."

Alle [singing]. Eine feste Burg ist unser Gott,
Eine gute Wehr und Waffen.
Er hilft uns treu aus aller Not,
Die uns je hat betroffen.
Der alt' böse Feind,
Wie ernst er's jetzt meint!
Gross Gewalt und viel List
Sein grausam Waffen ist.
Auf Erd ist nicht seinesgleichen.

Das Wort sie sollen lassen stahn
Und kein' Dank dazu haben.
Gott ist bei uns hier auf dem Plan
Mit allen seinen Gaben.
Nehmen sie uns den Leib,
Gut, Ehr', Kind und Weib,
Lass fahren dahin,
Sie haben kein' Gewinn,
Das Reich muss uns doch bleiben.

Penn. This song has often comforted you in misery and persecution, and often have you sung it during your first struggle in this country. The hardest time is now over; you have a fair settlement and new, peaceful homes, and the first two-story house is built. In cheerfulness and diligence you have raised wine and flax, and woven German linen, serving God piously, according to your worthy leader's motto, "Bete und arbeite — Pray and work." To show you how we appreciate this, we have decided to receive your community among the towns of Pennsylvania as the first German township. Germantown shall be its name henceforth, and this shall be your seal [shows the seal], a clover leaf with the Latin words *vinum, linum, textrinum*: wine, flax, and loom — a symbol of your cheerfulness and industry.

Pastorius. Wir danken dir, Wilhelm Penn, und Euch amerikanischen Brüdern! Wir danken Euch, dass Ihr uns als gleichberechtigte Brüder unter Euch aufgenommen habt, und wir versprechen Euch, stets für die Wohlfahrt dieses Landes unser Bestes zu thun. Wie bisher, wollen wir auch in Zukunft in Gottesfurcht leben und nach dem Motto *Vinum, linum, textrinum*—Wein, Lein, Webeschrein!

Alle Deutschen. Heil Wein, Lein, Webeschrein! Heil *Vinum, linum, textrinum*!

MORNING EXERCISES.

BERTHA PAYNE.

					LEADER.
February	4.	Isthmian Canal	-	-	Miss Stilwell
	5.	Greek Heroes	-	-	Mrs. Thomsen
	6.	Old Pipes and the Dryad	-	-	Miss Curtis
	7.	Charles Dickens	-	-	Miss Crawford
	11.	" Rondes "	-	-	Miss Ashleman
	12.	Patriotic Songs	-	-	Miss Payne
	13.	Current Events	-	-	Mrs. Atwood
	14.	St. Valentine's Day	-	-	Miss Allen
	18.	Gymnastic Drill	-	-	Mr. Kroh
	19.	Songs	-	-	Mrs. Bradley
	20.	Winter Birds	-	-	Mr. Meyers
	21.	Washington's Birthday	-	-	Miss Rice
	25.	Grains	-	-	Mrs. Norton
	26.	Chicago	-	-	Miss Van Hoesen
	27.	Jungle Stories	-	-	Miss Wygant
	28.	Jeanne d'Arc	-	-	Miss Ashleman

HISTORICAL EVENTS AND BIRTHDAYS.

February	3.	Felix Mendelssohn Bartholdy	-	-	1729
	7.	Charles Dickens	-	-	1812
	10.	Treaty of Paris closed French and Indian War	-	-	1763
	11.	Thomas A. Edison	-	-	1847
	12.	Abraham Lincoln	-	-	1809
	12.	Charles Darwin	-	-	1809
	12.	Peter Cooper	-	-	1791
	12.	Alice Carey	-	-	1820
	15.	Galileo	-	-	1564
	17.	Evacuation of Charleston	-	-	1865
	18.	Charles Lamb	-	-	1775
	19.	Edgar Allen Poe	-	-	1809